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STUDIES OF THE FISHES OF THE ORDER *CYPRINODONTES*. VII. *GAMBUSIA MANNI*, A NEW SPECIES FROM THE BAHAMAS

Species of *Gambusia*, belonging to the typical subgenus, abound in the fresh-waters of the West Indian islands. They have been revised by Regan (1913) and Hubbs (1926). These little fishes are members of the family Poeciliidae—viviparous cyprinodonts of the New World. Very recently, on March 18, 1927, Mr. Stephen Howies, an artist of Washington, caught a considerable number of live examples of a *Gambusia*, locally known as "millions fish", in a fresh-water lake on New Providence, one of the Bahamas. These he brought back home for Mr. William M. Mann, the Director of the National Zoological Park, and an aquarium enthusiast. Some have been distributed among the aquarium folk of Washington, with whom they have met with a considerable degree of favor.

The Bahama *Gambusia*, as represented by these New Providence specimens, appears to be a distinct and unnamed species, belonging to the typical subgenus *Gambusia* (see Hubbs, 1926). In the complete absence of inky black specks on the body it resembles *G. caymanensis* from the Cayman Islands south of Cuba, but that species is described by Regan (1913, p. 990) as having the dorsal fin farther forward. In this color character it probably agrees also with two of the Jamaican species described as new by Regan, namely *G. wrayi* and *gracilior*, but those species, as well as *G. dominicensis*, are figured by Regan as having the serrae of the gonopodium (the modified anal fin of the male) much shorter. The Bahama species has long serrae, in fact its gonopodium does not appear to differ at all from that of another Jamaican species, *G. oligosticta* Regan, or of a Cuban species, *G. punctic-ulata* Poey. It differs from both of these, as well as from *G. domenicensis* Regan from Haiti, in the complete lack of the inky black spots on the body. It

differs further from *oligosticta* in having a slenderer form, and from *puncticulata* in having a longer head. With which one of this complex of Antillean species *G. manni* is most closely related could hardly be conjectured. It is absolutely clear, however, that its relationships are with the Antillean rather than the mainland types.

The reference of specimens of *Gambusia* from the Bahamas to *G. affinis*, by Bean (1905, p. 299) and by Rosen (1911, p. 49) are probably erroneous, for these authors presumably had the present species.

The type-specimen is a male 23.5 mm. long to caudal fin, Cat. No. 72183, Museum of Zoology, University of Michigan. A male and two female paratypes are in the same institution, and two others are deposited in the National Museum. The body is formed as in related species, that is, with an angulated axis, so that when the rather flattened anterodorsal contour is applied to the surface film, the tail projects somewhat downward into the water. The greatest depth of the body is contained 4.0 times in the standard length (3.9 times in the male paratype 18 mm. long; 3.6 to 4.4 times in female paratypes 16 to 25 mm. long); the least depth of the caudal peduncle, 2.0 (2.1; 2.2 to 2.4) times in the head. The head is rather broad and heavy; its upper surface is about flat in both transverse and longitudinal axes; its greatest breadth is a little greater than the length from tip of snout to posterior margin of pupil in males, and equal to the length back to the hind border of eye in females; its length is contained 3.35 (3.3.; 3.0 to 3.3) times in length to caudal. The interorbital width enters the head length 3.0 (2.6; 2.5 to 2.7) times; length of snout, 3.3 (to 3.4) times; eye, 3.6 (3.4; 3.1 to 3.4). The lateral gape is quite well developed, for the length of the upper jaw is equal to the width of the mouth. The margin of the mandible is somewhat semioval in the males, but semicircular

in the females. The upper lip is about one-fourth as long as wide.

Dorsal rays 8, anal 9, counting the last as split to base; principal caudal rays 14 (12 to 14 branches); pectoral, 13; pelvic 6. The origin of the dorsal is located in the males behind end of the anal, and midway between base of caudal and the occiput, and in females slightly before the end of the anal base, and midway between base of caudal and upper end of pectoral base. The dorsal fin is rounded anteriorly, but rather acute and high behind; its depressed length is contained 1.2 (1.4; 1.5 to 1.8) times in head. The caudal is subtruncate; 1.3 (1.2; 1.4 to 1.5). The pectoral reaches to above middle of anal base in males but only to above the anus in females; 1.4 (1.2; 1.4 to 1.5). The short pelvic extends to the origin of the anal in the males, but only to the anus in females. The anal fin of the female is almost straight-edged, and its depressed length in that sex equals that of the dorsal. The male anal or gonopodium is contained 2.8 to 2.9 times in the total length, and it falls short of the caudal by about the length of the eye.

In alcohol the color is moderately dark. The scale pockets, except in the silvery abdomen, are margined, widely above and narrowly below, with dark. The axial streak is fine and black posteriorly, but runs anteriorly into a suffused lateral band, more or less interrupted. Some specimens show indistinct lengthwise dusky streaks on the upper sides and of these the first above the axial streak may be broken up into faint specks. The fine mid-dorsal streak is usually fairly conspicuous before the dorsal fin. The streak between anal and caudal fins is even finer. The head is blackish on the edge in line with the axial septum; on the upper part of the opercle; over the brain; in a dash on the lateral edge of the snout and on the middle of the mandible; sometimes over the whole mandible or chin, and always in the oblique bar below the eye (this bar is more conspicuous in males

than in females). The dorsal fin bears one to three, usually two rows of faint to black spots; the caudal has often two rows of spots, in addition a variable amount of very fine pepper-like speckling. The anal fin often has some dark pigment, in either sex, within its margin.

In life the colors are pleasing though scarcely brilliant—as aquarium fishes run. They are a pale translucent olive-green: the vertebral column and associated structures, the air-bladder and the underlying opaque abdominal peritoneum all show through the body wall under favorable light. The sides show a silvery sheen anteriorly, and in proper light the silvery is enlivened with a metallic greenish luster. Seen from above are two metallic crescents, arched outward, on each side of the top of the head posteriorly and nearly in line with two metallic streaks which converge backward from the occiput. The dark scale margins and the axial and dorsal and ventral streaks must be looked for with a little scrutiny in the living fishes. The dusky mouth region is fairly conspicuous, but the oblique streak below the eye is rather dim, in the female scarcely apparent. The "puberty spot", when developed in pregnant females, is deep black. The fins are hyaline under most lights, but occasionally the caudal near its base and the dorsal near its lower posterior angle shine with silvery luster. The black spots on the fins are clearly evident in life.

Aquarium examples of *G. manni* share their time between mid-water and surface. When disturbed they scurry to the water weeds but in general move about rather openly and slowly. While at the surface the flattened back may be appressed against the surface film, but even then the angulated body axis keeps the caudal entirely under water.

This species reaches a rather large size for a *Gambusia*, for females as long as about 5 cm. to caudal

and males ranging up to about 3 cm. in length have been seen.

This species will probably retain its original favor as an aquarium fish. It is small and hardy, pretty though not gaudy and active though not restless.

It may well serve another purpose, for species of *Gambusia* have proved of preeminent service to man in the war on mosquitos and the diseases carried by these insects. The habits of this species and the relatively large size of its mouth very probably would render it particularly valuable in mosquito control. Since it comes from so far south, it might prove more desirable than the United States species for introduction into other tropical regions. At least the species deserves study from this standpoint.

This species is named for Dr. William M. Mann, the distinguished Director of the National Zoological Park in Washington, through whose interest I secured the type-specimens.

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APPENDIX

As this paper is being written for the press, there has come to hand a report on new American fishes by Jordan and Evermann (Proc. Calif. Acad. Sci., (4) 16, 1927, pp. 501-507). On p. 502, *Girardinichthys limnurgus*, from Lake Lerma, Mexico, is described as new. This species was based on material recorded as *Girardinichthys innominatus* by Evermann and Goldsborough (Bull. U. S. Fish Comm., 21, 1901 (1902), p. 149). But Meek described the same form as *Characodon multiradiatus*, quoting *G. innominatus* Evermann and Goldsborough as a synonym, in 1904 (Field Mus. Publ. 93, (Zoöl. Ser.) 5, 1904, p. 119). This species was later described and figured by Regan (Biol. Centr. Am., Pisces, 1907, p. 88, pl. 12, fig. 3-4), and made the type of a new genus, *Lermichthys*, by me (Univ. Mich. Mus. Zool. Misc. Publ., No. 16, 1926, p. 18). *Girardinichthys limnurgus* Jordan and Evermann, 1927, therefore becomes a synonym of *Lermichthys multiradiatus* (Meek), 1904.

CARL L. HUBBS

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ALEPISAURIS CAUGHT ON HALIBUT HOOK

The College of Fisheries received on July 13, 1927, a fine specimen of *Alepisauris ferox*. This is the fourth specimen of this fish received by us from the North Pacific in two years, and the third which was caught on halibut gear.

The first specimen was caught on a halibut trawl February, 1926, off Triangle Island. No depth or other data were given.

Another specimen was caught in Hecate Straits by a halibut boat in May, 1927, at a depth of 140 fathoms.

The third specimen was caught 12 miles E.S.E. off Cape St. James, Queen Charlotte Island, at a depth of 170 fathoms, by Captain Rekdal, Schooner Urania, Seattle.

D. R. CRAWFORD

College of Fisheries,
Univ. of Washington.

THE BLUE-TAIL SKINK OF KANSAS (*EUMECES GUTTULATUS*).

On August 14, 1926, about dusk, I caught a blue-tail skink or *Eumeces* about five inches long. He was about to disappear under a sidewalk so I had to grab him by the tail to pull him out. It was surprising that the tail did not break. Most lizards of my acquaintance would have rather given up their tail than their liberty. The weather remained hot through most of September, but I was unable to get another skink and saw only two others although I searched diligently while snake hunting.

His first home was in a milk bottle. He showed no fear and greedily ate small crickets and "sow" bugs. Next he was placed in a glass case with various snakes and spiders. The first trait noticed was his habit of tasting the air with his tongue like a snake. The tongue is pink and is merely protruded and withdrawn and not wagged.

Curiosity is strong in him. He will approach any new or strange object or specimen peering and protruding his tongue. If convinced that danger threatens he raises his blue tail vertically and waves it a few times gracefully and slowly and then retreats. When an awesome animal approaches him he arches his back and stands stiff-legged like a cat. In walking normally he drags his legs as if swimming lazily. Sometimes he drags both hind legs.

He drinks frequently, lapping the water with his little pink tongue like a kitten and not with the muzzle under water like the snakes hereabouts.

He shed his skin in fragments on August 28, and emerged as if freshly varnished. Belly and throat gray, back dark brown with tinge of green posteriorly with faint suggestions of lighter longitudinal lines, sides with a touch of chestnut. Upper lips touched with a few drops of white enamel, lower lips and over eye with drops of cream and brown respectively. A light spot behind ear opening.

After the first frosts of October I caught a medium sized grass hopper that had lost its hoppers and been discolored by the frost. I introduced it thinking that a snake might fancy it. It prospered and on the 10th laid a mass of eggs surrounded by a quick-hardening froth. Of this more later.

The blue-tail had been "off" sow bugs which were the only food I could find. November 6 was very warm and I caught a small cricket which the lizard ate. A half inch green grasshopper hopped about successfully evading the lizard's advances. Finally the lizard got his eye on the hopper and raised high his blue tail and waved it rapidly and gracefully making letter S's and then pounced on and devoured the small hopper. The tail waving seemed to serve as a distraction from the real danger, like the nervousness inherent to the end of a cat's tail.

On November 28 the original hopper laid another order of scrambled eggs which the lizard helped her eat. This was the only dead food the lizard had touched.

The lizard spends much of his time buried under the sand in a torpor, but comes out occasionally and is then very active.

On December 11, 27, Jan. 21 and Feb. 1 the grasshopper served eggs. She is getting very much bedraggled and has only one uninjured leg left. She has to be placed on her food and righted when she careens

too far. She enjoys the choicest of Florida vegetables and eats raw chicken meat with relish. She eats ravenously after laying, but for several days before she spends all her time trying to dig a hole through the bottom of the cage with her strong ovipositors.

On Feb. 16 I caught a 3-4 inch cricket which the lizard ate head first. Apparently the hopper feeling that spring had come and that we could do without her gave up the ghost and another batch of eggs—black this time—on the same date.

CHAPMAN GRANT

Wichita, Kansas.

NOTE ON SEA TURTLES

I can find no allusion to marine turtles coming ashore except to lay eggs. Even the "Natural History of Hawaii" makes no mention of an exception. Both sexes of *Chelonia agassizii* spend many hours basking on the beaches of the uninhabited islands of the Hawaiian group where there is no outlying reef. They even climb onto sheltered rocks to bask where no beaches occur. This leads one to wonder whether all green turtles come ashore to bask where they were not persecuted.

CHAPMAN GRANT

Wichita, Kansas.

ON THE URODELAN FAUNA OF SAKHALIN

The importance of the faunistic relations of Sakhalin Island both to the Asiatic continent or to the main group of Japanese islands attracted the attention of observers long ago.

So far as Reptilia and Anura are concerned, almost indisputable confirmation has long been established, while the Urodelan fauna has been the topic of discussion until quite recently. In Sakhalin, the first

salamander was collected by Saprunenko in 1890, and it was for the first time identified by Nikolski in 1905 with *Salamandrella keyserlingii* Dybowski, a species which spreads extensively over the northern Asiatic continent. This view was confirmed later by Stejneger[1] (1907) who studied the same species in detail as he worked on the Kamchatkan fauna. His publication resulted in attracting the immediate attention of several Japanese herpetologists who made references to this form on conjunction with other amphibians from Japan proper, but they contributed little additional to our knowledge of the subject.

Andersson (1917) on the contrary, regards a specimen collected from Sakaehama, on the east coast of Sakhalin, as a distinct species, known as his *Salamandrella cristata*. Recently Dunn[2] (1923) in dealing with the Japanese salamanders, accepted Andersson's species as valid and referred to it as *Hynobius cristatus* (Andersson), relying upon Andersson's original description.

Subsequently, in the spring of 1925, I collected four specimens of salamander, two of which were obtained at Odomari, on the southern coast of the island, and two others at Sakaehama from whence came the specimens of Andersson. With the diagnosis of *Salamandrella keyserlingii* Dyb. of Stejneger (1907) as a foundation and taking into consideration *Hynobius keyerlingii** and *H. cristatus* of Andersson as quoted by Dunn (1923), I (1925) identified[3] the species with *Salamandrella keyserlingii* Dyb., confirming the view of Nikolski as well as Stejneger.

In the succeeding year (1926) I obtained 15 more salamanders from Sakaehama and this spring had an

1. Herpetology of Japan and adjacent territory. 1907, U.S.N.M., Bull. 58.

2. The salamanders of the family Hynobiidae. 1923, Proc. Am. Acad. Art. Sci., vol. 58, no. 13.

* Synonym of *Salamandrella keyserlingii* Dyb.

3. A note on the Salamander from Sakhalin. 1925, Zool. Mag., Vol. 37, No. 446, (Tokyo).

opportunity to compare them with authentic specimens in the United States National Museum collected in Kamchatka (Nos. 22594, 23531, 31712-31716 and 36414-36419), in Siberia (No. 66520) and in Manchuria (No. 53366).

This study has left me no room for doubt that the salamander native to Sakhalin represents the same species as those from the continent. *Salamandrella keyserlingii* Dyb. is abundant in Sakhalin and is the only species which is yet known from that island.

It is worth while to remark, by the way, that the Soya Strait between Sakhalin and Hokkaido is a definite zoo-geographical line of demarcation as to the Urodelan fauna, a fact already emphasized by Hatta[4] as regards the Reptiles and the Anuran amphibians.

TETSUO INUKAI

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Sapporo, Japan.

THE WAY OF A SNAKE WITH A GOPHER

This is an account of an incident which I witnessed several years ago, but which I had been reluctant to publish owning to lack of certainty regarding the creatures involved. Recently, however, Mr. Remington Kellogg and Dr. Francis Harper have assured me there can be little doubt that the participants were a bull snake (*Pituophis sayi*) and a pocket gopher (probably *Geomys lutescens*).

While I was walking slowly through a field of partly grown alfalfa with humerous open spots, at Cambridge, Furnas County, Nebraska, one sunny afternoon in August, 1921, a sudden flurry of sound and movement a yard or more ahead drew my attention to a gopher struggling in the folds of a snake five feet or more in length. I "froze" instantly, hoping thereby to escape notice and see something of interest.

The gopher had apparently just rushed out of its

4. Zur Tiergeographie von Hokkaido. 1913, Zool. Anz., Bd. 43, No. 1.

burrow a couple of feet in front of me, possibly chased out by the snake; at all events it had been seized very soon after it emerged. The snake had thrown two coils of its body around it and was steadily constricting; the gopher presently ceased to breathe or struggle and lay motionless in the coils of its enemy.

The snake relaxed its coils little by little, pausing several times to detect any sign of life in its prey, which lay immobile. Approaching it with its head, it explored the lax body with its tongue, seized it by the nose, and dragged it to within twelve or fifteen inches of the opening of the burrow. Then it reared its head a foot or more into the air and looked about, turning in several directions.

As I stood motionless, though in plain sight and very near, it paid no attention to me or took alarm. Lowering its head to the ground, it crawled into the burrow, entirely out of sight, was gone for a minute or two, and then came partly out, head first, having turned around in the burrow. It looked all about again, but seeing nothing to be alarmed at, approached the gopher, flickered its tongue about it again, seized it by the nose, hooked its jaws firmly over the head, advancing them first on one side then the other, upper and lower, until it had secured a satisfactory hold, then withdrew itself and its prey backward down into the burrow, there to feast upon and digest the meal it had secured, in safe seclusion underground.

The relation of the bull snake to pocket gophers has been discussed recently by Hisaw and Gloyd (Journ. Mammalogy, vol. 7, no. 3, August, 1926, p. 200-205).

Peabody Museum, Salem, Mass. ALBERT P. MORSE

A SPECIMEN OF THE VIRGINIA RED KING SNAKE WITH UNMARKED UNDERPARTS

On April 13, 1927, while collecting insects, I pulled

off the bark of an oak log, and found a good sized specimen of this species (*Lampropeltis elaposides virginianus* Blanchard) which had the underparts wholly pure white from chin to a little beyond vent except for a slight encroachment of the color of the upper parts.

Length 436 mm., tail 57. Upper labials 7-7, lower labials 8-8, first row of temporals 1-2, preoculars 1-1, postoculars 3-3, loral 1-1, ventrals 164, subcaudals 35 pairs, scale rows 19-19-17.

Eighteen black bordered red saddles on body and four more on tail, the last three of the latter completely encircling the body, these saddles narrowing on the sides and extending about one scale width on the ventrals, bordered by black below only very slightly and brokenly except in one case on each side and in these two cases the saddle is abnormal, extending in the one case only to the fifth row of scales and in the other having its lower portion cut off by a narrow longitudinal white band. The saddles are separated by the usual narrow white crossbands which widen on the sides as usual. Belly except for the encroaching ends of the dorsal saddles wholly white without markings of any sort. Top of head red edged behind with a narrow black bar across the extreme posterior margin of the parietals, the black extending forward in a broken line along the suture between the two parietals and expanding into an irregular transverse patch along the suture between the frontal and the anterior ends of the parietals.

C. S. BRIMLEY

Raleigh, N. C.

AN APPARENTLY NEW SALAMANDER (*PLETHODON CLEMSONAE*) FROM S. C.

Plethodon clemsonae, n, sp

Diagnosis. A black *Plethodon* of the *jordani-shermani-metcalfi* group without red pigment but usually with some white pigment spots overlaying the black

pigment on the back; with about ten teeth in each vomerine series and with pale throat and very dark belly.

Type. C. S. Brimley No. 7761, male taken at Jocassee, S. C., by J. A. Berly of Clemson College, on April 8, 1927 at an elevation of 1200 to 1500 feet. Length 118 mm., tail from hind edge of vent 56; black above and below, much lighter but not mottled on throat and breast, no light pigment dots on sides but a double row of faint roundish, rather sharply defined grayish spots on the back; belly nearly as dark as the back. Appressed toes separated by one costal fold. Vomerines 10-10 extending beyond inner nostrils. Costal folds 14.

Paratype. CSB No. 7762, same place and date, taken by F. Sherman. Length 132, tail 67. Similar to type but with only faint traces of the pigmented spots on back: appressed toes separated by two costal folds; vomerines 9-10. Female.

Paratype. CSB No. 7763, same place, date and collector as preceding. Length 57, tail (mutilated) 17. Back frosted with white pigment dots, arranged in irregular patches and extending very little on sides: appressed toes meeting.

Paratype. Clemson College No. 69. Male, length 149, tail 80, similar to type but throat paler and no pigment dots on back: appressed toes separated by one fold; vomerines 9-11. Taken at Jocassee, S. C., March 7, 1927 by Mr. Sherman near the lower falls of Whitewater.

The first three specimens were received by me alive and showed the usual lack of slime characteristic of the *jordani* group to which this form apparently belongs. It seems to be nearest *jordani*, with which it agrees in the more numerous vomerine teeth and the dark underparts, which however are even darker than in that species, but differs in the absence of red on the sides of the head. From all species of the group it differs in the usual presence of white pigment dots on

the back, these however are lacking in the largest specimen. From *glutinosus* it differs in the pale, unmottled throat, the lack of slime, and the absence of white spotting on the sides.

The type specimen will be deposited in the U. S. National Museum, paratype 7762 will be retained in my collection, and the other two paratypes will be returned to Mr. Sherman, State Entomologist of South Carolina, at Clemson College, to whom I am indebted for the privilege of examining and describing these specimens and whose property they are.

C. S. BRIMLEY

Raleigh, N. C.

AMPHIBIANS AND REPTILES OF DONIPHAN COUNTY, KANSAS

As a part of a survey of the land vertebrates of a small area in eastern Kansas which the writer carried on between 1921 and 1925 specimens were secured and habitat notes taken for the amphibians and reptiles. All the specimens collected were given to the University of Kansas Museum.

All observations herein recorded were made within one mile of Geary, Kansas. The area studied included a typical section of the valley of the Missouri River in that region. In addition to the river the area included a creek, a portion of the timbered bluff, several springs, an old saucer lake, several hundred acres of uncultivated bottom-land, and some cultivated ground.

AMPHIBIANS

Bufo woodhousei Girard.

Toads were found commonly in the moist parts of the area throughout the summer. Early in the morning or late in the evening individuals were often seen near houses under which they rested during the day to emerge and hunt for insects at night. An open pit that was made in constructing an ice house was a

favorite resort for this animal and several spent the whole summer of 1923 there. They were found in small holes and crevices of the vertical banks.

On April 19, 1924, a half grown toad was taken from a garter snake that was on the bank of the creek and which had nearly swallowed the toad.

Two males were seen at the edge of the water on the west side of the lake on April 25, 1925. A small toad was taken on the bluff near the lake on May 3, 1924.

Thousands of young and recently emerged toads were seen along a path near the lake on July 6, 1923. They were about half an inch long. One or two were disturbed at nearly every step along the path.

The latest fall record is October 11, 1924, when one was seen at the side of the road on the bluff.

Hyla versicolor LeConte. Common tree toad.

Several were heard calling on the bar and on the bluff and especially near the lake on April 25, 1925.

One was taken from a weed one foot high on the bar near the lower edge of the bluff on May 3, 1924. Another was found on a small bush near the top of the bluff on July 19, 1923.

Acris gryllus (LcConte). Cricket frog.

This species was the most abundant amphibian within the limits of this area. It was found most abundantly at the edges of bodies of water in all parts of the area in spring although some were found on the shores of the lake through the summer and until late in the fall.

On February 2, 1924, several were found in the creek above the bridge. They were in the water above some old ice and below a top layer of new ice. All the frogs were stiff and floating and apparently they were dead.

In the warm water of the springs and just below the springs a few frogs of this species were found throughout the winter.

In the spring the number of individuals present at the edge of the water began to decrease after the first of May.

Pseudacris triseriata (Wied).

One was taken from the edge of the water in a marshy place below a spring on April 4, 1925.

Rana pipiens Schreber. Leopard frog.

The leopard frog was found commonly wherever there was water either in standing pools or in running streams.

One was seen at the edge of a pool in the creek on March 1, 1924. Others were seen in the same pool, hiding among the leaves on the bottom, on November 17, 1923. On November 29 when there was nearly half an inch of ice on the pool the frogs moved stiffly on the bottom and under the edges of the stones. One was caught in a net in weeds in the bottom of the lake on March 2, 1924.

On April 6, 1924 one was seen near the edge of the lake that was so filled with air that it could not go under the water although it made an effort to do so.

Eggs were found in the lake and in the creek on April 19, 1924.

Rana catesbeiana Shaw. Bullfrog.

Bullfrogs were found in pools of the creek and in cut-off pools of the river but they were much more frequent in the lake.

On January 22, 1924 hundreds of tadpoles of this species were swimming at the surface of holes where the ice had been removed from the center of the lake. This was the most active animal in the water at that time.

Gastrophryne carolinensis (Holbrook).
Narrow-mouthed toad.

A narrow-mouthed toad was found on the area in the summer of 1923.

REPTILES

Plestiodon fasciatus (Linnaeus). Blue-tailed skink.

This skink was found over all of the bluff. When disturbed it usually ran under stones, leaves, or logs or climbed over stumps and trunks of trees. The earliest record of activity for this animal is April 6, 1924 when one was found on the bluff near the lake.

Young were seen under logs as early as June 12, 1923.

On May 6, 1923 two were seen on a large rock on the bluff which were holding one another by the mouth and moving back and forth across the rock. When they were disturbed they separated and ran into holes in the rock.

One was found hibernating in a pile of sawdust late in the winter of 1924.

Carphophis vermis (Kennicott). Ground snake.

One that was about one foot long was found on wet leaves on the ground near a spring on the lower part of the bluff on June 27, 1922.

Diadophis punctatus (Linnaeus). Ring-neck snake.

Two adults were found under boards in June of 1923. One was in a barnlot and the other was at the edge of a field near the creek.

Several young were found in a hole in the ground at the side of a road by road workers on September 1, 1923.

Coluber constrictor flaviventris (Say.) Blue racer.

This snake was found on the bluff, on the bar, and in the fields. It was frequently found in trees. One was coiled in a Phoebe's nest in an old building on the bluff on July 7, 1923.

Elaphe laeta (Baird & Girard).

One was found in a small tree on the bluff on June 14, 1923. One was found later in the season in the top of a hay barn. It may have been brought in from the field in a load of hay.

Elaphe obsoleta obsoleta (Say). Pilot blacksnake.

The pilot blacksnake was found all summer in all parts of the area. It was often seen in trees and in holes in trees. This was one of the most numerous as well as one of the larger snakes of this region and was probably the most destructive to bird life. Individuals were found in nests of the Cardinal and the Blue Jay.

Pituophis sayi (Schlegel).

A large bullsnake was eating young rabbits in a nest on the lower part of the bluff on April 25, 1925. The snake was coiled over the nest to prevent the escape of the rabbits and had one of the young mammals in its jaws. As soon as the snake was moved the rabbits ran in every direction.

A few snakes of this species were seen along roads and on the bar in June of 1923.

Lampropeltis triangulum (Lacepede). Milk snake.

One was found in a hole in the ground, at the side of a road, by road workers on September 1, 1923.

Natrix sipedon fasciata (Linnaeus).
Common water snake.

This snake was found at the edge of the water of the river, creek, and lake. During flood seasons it was frequently seen on drift at the edge of the river. One was found under a board at the edge of Doniphan Lake on May 18, 1924.

Storeria dekayi (Holbrook).
Dekay's snake; brown snake.

One was found under a board near the mouth of the creek on the bar on April 7, 1923. Another was found near the water of the creek on April 21, 1924. It was fourteen inches long. One was found on the side of the bluff on November 15, 1923 and another was seen in a small hole in the creek bank on December 2, 1922.

Thamnophis sirtalis parietalis (Say).
Common garter snake.

This snake was usually found near the water of the creek or of the lake. One was seen eating a half grown toad on April 19, 1924. On January 31, 1924, one was seen in a spring along the lower part of the bluff. When it was disturbed it crawled back into a crack of a rock. Another was seen in the water of a spring on February 23, 1924. A few were seen in trees near the water.

Thamnophis proximus (Say).

This species was found near the water and sometimes on the drier ground near the top of the bluff. It was frequently found near the ground in the smaller trees.

One was seen on the lower part of the bluff on April 6, 1924. On November 30, 1922 one that was about two feet long was found in a spring.

Agkistrodon mokasen (Beauvois). Copperhead.

Individuals were seen among the rocks on the bluff and near the lake on April 14, 1923 and April 19, 1923. On July 2, 1923 one was found under a pile of cottonwood slabs in the E. V. Roundy yard.

Crotalus horridus (Linnaeus). Common rattlesnake.

A rattlesnake was found half way to the top of the bluff north of the lake on May 3, 1924. One was shot from a limb of a tree on the lower part of the bluff and fifteen feet from the ground on May 20, 1923. On June 12, 1923, one about three feet long was found coiled in a patch of sumac near the top of the bluff. A small one was killed six feet from the ground in a tree and near the creek on June 13, 1923. One that had recently shed was killed in a chicken coop just after dark on June 25, 1922. One was killed near the river on the bar on June 26, 1922.

Chelydra serpentina (Linnaeus). Common snapper.

On March 29, 1924 a large adult that was in the

water above the bridge of the creek was too cold to move rapidly. When it was placed on its back it did not right itself. There were several leeches on the under side of this animal.

A small snapper, about ten inches long, was crawling in the road on April 25, 1925. On May 19, 1923 one was crawling over the mud at the edge of the lake and toward the shore. In the afternoon one was seen crawling up the creek in shallow water. Its head was under water part of the time but its back was showing all of the time.

A female that was caught on June 4 was filled with eggs. It was in the creek. On July 12, 1923 a young turtle about one and one half inches long was seen in a small puddle of water along a road. Its gullet was filled with the remains of a cricket frog.

On September 1, 1924 two large snappers, in a pool in the creek, were swimming near the surface, in the center, and were fighting. Each tried to catch hold of the other in its jaws. Finally one went down and in a few minutes the other retired below the surface.

A rather sluggish adult that was worn and appeared to be very old was seen crawling on the bar near the bluff and at least a quarter of a mile from any water on October 29, 1922. On December 1, one was found, near this location, that was dead and which was probably the same that was seen on October 29.

Pseudemys elegans (Wied).

On January 22, 1925 two were taken from a hole in the ice of the lake. Each was about ten inches long. Both were killed.

A female was picked up in a pasture near the creek on June 15, 1923 which contained eggs not yet covered with shells.

Amyda spinifera (LeSueur). Soft-shell turtle.

Individuals were caught, swimming under water in the creek, on the bar on April 20 and 21, 1924.

Berkeley, California. JEAN M. LINSDALE

NOTES ON *PHYLLORHYNCHUS*

A specimen of the rare *Phyllorhynchus decurtatus* was found dead in the road 28 miles west of S. Oasis near Kane Springs, California, on August 14, 1925, by A. A. Wright and A. H. Wright. It had attempted to cross the road apparently the evening of August 13. The specimen had been run over and the head flattened and bruised. The condition of the specimen makes it difficult to count the labials and oculars. The rest of the body is intact, although dried by the sun.

The total length after being preserved in formalin is 433 mm.; the tail is 67 mm. The scales are smooth, the numbers of gastrosteges 177 or 178, the caudals 37 or 38, the anal plate entire. The peculiar leaf-like rostral, free along the sides and separating the supranasals entirely (see Cope's figure 186, Report of the National Museum, 1898, p. 823) gave immediate key to the genus.

The supra-labials, as far as the mutilated condition of the specimen admits of certainty, are 6 on both right and left side, the infra-labials, 8-9. The oculars, as far as possible to be sure, are 5 on each side, and the temporals on the right side, 3-3. The temporals on the left are impossible to count.

The color pattern checks with that described by Cope (32 dorsal patches) except that this specimen has about 11 more dark mid-dorsal patches (43 spots). However Miss Sara Atsatt (Copeia, July 15, 1921, No. 96, pp. 35-36) records 46 on her specimen, secured in Tahquitz Creek, near Palm Springs, Riverside County, California.

There is a double row of small dark lateral spots more or less alternating with the dorsal row of 43 spots. The belly in unspotted. There is a dark oblique spot from the eye to the angle of the mouth and one on the outer edge of each parietal.

A hurried color note taken August 15, the day after the specimen was taken records that it was "light

vinaceous fawn or pale cinnamon pink; the spots black or brownish; the head deep olive; underparts glistening white". Our photograph in no way reveals the color pattern or general appearance as does Miss Atsatt's excellent photograph, a copy of which Prof. P. A. Munz gave us (see VanDenburgh, p. 172).

This specimen is the second specimen recorded from California, one being taken at Yuma, Arizona, and three in Lower California.

On May 5, 1923, Mr. and Mrs. R. B. Alves of El Paso, Texas, on the road from Lordsbury, N. M., to Rodeo at Granite Gap, about the halfway point, or 19 miles from Rodeo, found a small snake which they noted had a truncated snout. After their description we showed them Cope's figures of *Phyllorhynchus browni*. They felt it was the form they found. Of course the specimen would make it a positive record but this is recorded because of the local nature of the other six specimens (3 at Tucson, and 3 at San Xavier Mission, southwest a few miles).

RHENA V. MEDDEN

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NOTE ON *GOPHERUS BERLANDIERI* IN LOUISIANA

Strecker's note on *Gopherus berlandieri* (Agassiz), Copeia, No. 161, January 13, 1927, calls to mind a specimen of this species captured on April 29, 1917 on Avery Island in South Central Louisiana by Alfred M. Bailey and myself. The specimen was found in a cage trap located in the fence of the state game farm, a number of such traps being used as a protection against marauding creatures.

The carapace of the tortoise is $6\frac{3}{4}$ inches in length, the plastron $6\frac{3}{4}$ inches, the greatest width 6 inches and the height $3\frac{1}{2}$ inches. The specimen was mounted by Bailey, then taxidermist at the Louisiana State Museum and still reposes in that institution.

In spite of much extensive and intensive collecting in Louisiana, I have never seen any other *Gopherus* taken in this state west of the Mississippi River. Constant inquiry among the best informed residents, sportsmen and teachers, fails to reveal the occurrence of tortoises in that entire region, and even the "oldest inhabitants", not only on Avery Island but in other sections of West Louisiana, have no recollections of them, even in regions where other Texas fauna is creeping in.

In the light of our present knowledge, I would not attempt to account for the presence of this turtle, except perhaps as an escaped captive, although its actual liberation may have occurred some years ago.

PERCY VIOSCA, JR.

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A NEW MOUNTAIN RACE OF DESMOGNATHUS

Some salamanders from the North Carolina mountains, collected for the National Museum by Mr. J. E. Benedict, Jr., indicate the presence of a remarkable local race of *Desmognathus fuscus carolinensis* in the Great Smoky Mountains. It may be called—

Desmognathus fuscus imitator subs. nov.

Type: U. S. Nat. Mus. No. 72762, collected by J. E. Benedict, Jr., June, 1927.

Type locality: Indian Pass, Great Smoky Mts., N.C.

Range: Known only from type locality.

Diagnosis: A race of *fuscus* allied to *carolinensis* and to *ochrophaeus;* small; with cylindrical tail; dorsal light band very indistinct; belly lead black; sides of head behind eyes bright red.

Description: Very similar to *carolinensis* except for color; area delimited by eye, postocular groove, and gular fold light in color (red in life in all?); this area includes normal Desmognathine postocular light line; the belly is lead black; the dorsal light band is indis-

tinct. These color characters vary slightly for 72761, the largest, has the area indefinitely marked, light; no dorsal band; No. 72762 has the area definitely outlined, clear light, and there is a trace of the dorsal band; No. 72763 has the area pale, divided, very faint dorsal band; No. 72764 has the area red, partially divided by an indefinite dark line along vertical postocular groove, the dorsal band is faint; No. 72765, the smallest, has the area all red, and a light dorsal band is evident.

	Head	*Body*	*Tail*	
72761	10.5	34	35.5	reg.
72762	10	31	36	
72763	10	32	14	reg.
72764	9	31	7	reg.
72765	9	28	26	reg.

Remarks: Mr. S. C. Bishop has collected on Mt. Leconte in the Smokies, not far from Indian Pass. He very kindly has given me information and lent me specimens. He took *P. jordani* there, but the *Desmognathus* of the *carolinensis* type show no light cheek patch. Their bellies however are very black, and their dorsal bands very faint and they thus differ from the ordinary *carolinensis* and approach *imitator*, and can be considered intergrades. He had five specimens, four of which were fairly large. The fifth was tiny, and was normal in color, with a light dorsal band, and light mottled belly.

My *carolinensis* from Mt. Sterling in the Smokies, taken in company with *P. jordani*, were perfectly normal (M. C. Z. No. 6400-15).

The ordinary large *carolinensis* has a dark dorsum with the light band obscured, but then the belly is lighter than the rest of the body. I have compared a number in the National Museum, specifically from Highlands (No. 38255-8) and from Cane River (No. 31122).

The only specimens of *Desmognathus* of this type from the Smokies are the three lots mentioned above.

The new form seems to be even more local than *Plethodon jordani*. Regarding the validity of the race, I can only say that all five specimens show the differentiating characters and all differ from the over 5000 Desmognathus and from the over 400 *carolinensis* I have seen.

Coincidence scarcely avails to explain the resemblance in color to its larger neighbor, nor does there seem to be any peculiarity in the environment of the Smokies which would evoke a similar and a peculiar coloration in two unrelated salamanders. That *D. carolinensis* should vary so as to resemble *P. jordani* within the range of the latter and nowhere else seems to be a clear case of mimicry, the only one known to me in Amphibians.

Other salamanders from the same locality collected by Mr. Benedict include specimens of *D. fuscus fuscus*, and of *D. quadra-maculatus*.

I am indebted to the authorities of the National Museum for the opportunity to describe this peculiar animal.

E. R. DUNN

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A LARGE BLANDING'S TURTLE FROM MICHIGAN

Emys blandingii (Holbrook) has, in Michigan, been known only from the southern peninsula. In July, 1927, a single specimen was found by Dr. Carl L. Hubbs on the shore of Ives Lake, which is in the northern part of Marquette County, and only a few miles from Lake Superior. The lake is isolated and there is little possibility that the specimen was introduced.

The specimen is remarkable for its large size. The measurements are: length of carapace, through the shell, 230 mm., over the shell, 300 mm.; width of

plastron, front lobe, 127 mm., hind lobe, 127 mm. The live weight was five pounds.

The largest specimens in the collection of the University of Michigan have the following dimensions: length of carapace, through the shell, 190 mm. and 195 mm.; over the shell, 250 mm. and 253 mm.; width of plastron, front lobe, 100 mm. and 103 mm., hind lobe, 107 mm. and 105 mm.

ALEXANDER G. RUTHVEN

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THE OCCURRENCE OF ANOLIS *CAROLINENSIS* VOIGT IN EASTERN TENNESSEE

The range of Anolis *carolinensis* Voigt has been defined as "North Carolina to Florida, westward through the Gulf Region to the region of the Rio Grande."[1] In the light of this known range, it is not absurd to predict (as herpetologists have) the occurrence of this Anolis in Tennessee. Troost[2] included this species in his list of Tennessee Amphibia and Reptilia, but no specimens or locality data are available. Rhoads[3] visiting Tennessee in 1895, did not find this lizard, although he states "I was frequently told of this species in western, middle and southeastern Tennessee." Neither Blanchard[4] nor Ruthven[4] took it in western Tennessee. In view of the fact that the following records are the first for the state, we believe it is worth while to add these notes to the literature of the subject.

1. Stejneger & Barbour, Check List of the North American Amphibia and Reptilia, 1923, p. 42.
2. Troost, Gereard, Seventh Geological Report of the Twenty-fifth General Assembly of the State of Tennessee, Nov., 1843, p. 39.
3. Rhoads, Samuel N., Contributions to the Zoology of Tennessee, Proceedings of the Academy of Natural Science of Philadelphia, 1895, pp. 376, 404.
4. Blanchard, Frank N., The Amphibia and Reptilia of Western Tennessee, Occasional Papers of the Museum of Zoology, University of Tennessee, July 6, 1922, No. 117, pp. 1-18.

The first specimen coming to the attention of the writers was taken 25 miles northeast of Chattanooga in Hamilton county (University of Tennessee collection No. 94); the next four came from about three-quarters of a mile west of Montvale Springs in Blount county (University of Tennessee collections Nos. 128, 136, 137, 138); and the last specimen came from four miles east of Townsend on the Elkmont Pike in Sevier county (University of Tennessee collection No. 87).

All of these specimens were taken in rather low, wet country, which as a rule was surrounded by dry shale slopes and dry deciduous forest areas. In Blount county, at an altitude of 1450 feet, the habitat was low and marshy, along the shore of a small lake which was almost completely surrounded by a luxuriant growth of deciduous forest and underbrush. One of these specimens was taken, some fifteen feet up, on a dead tree at the very margin of the lake. The others were taken on fallen trees in association with Eumeces *fasciatus* (Linné) and *Sceloporus undulatus undulatus* (Latréille). A careful search was made on the ridges higher up but failed to reveal a single additional Anolis.

J. Paul Jones
B. C. V. Ressler

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